THE CLAIMS

Having thus described the invention, what is CLAIMED is:

1. Stand-alone multiple gas analysis apparatus comprising: an FT-IR gas analyzer, including a gas sample cell; and at least one sensor operatively connected to said gas sample cell of said FT-IR gas analyzer for generating an electrical signal representative of the concentration of at least one atomic or homonuclear diatomic gaseous infrared-inactive component of a gas sample passing through, or contained within, said cell.

2. The apparatus of Claim 1 including at least one inlet conduit to said gas sample cell and at least one outlet conduit therefrom, said at least one sensor being disposed for effective contact with gases in at least one of said gas sample cell, said inlet conduit, and said outlet conduit.

3. The apparatus of Claim 1 wherein said FT-IR gas analyzer includes electronic data processing means programmed to determine the presence of infrared-active molecules in the gas sample, said electronic data processing means being operatively connected to said at least one sensor for improving the accuracy of gas-concentration data, in the signal from said at least one sensor, by adjusting said data as necessary to account for such infrared-active molecules.

4. The apparatus of Claim 1 wherein said gaseous infrared-inactive component to which said at least one sensor is responsive is selected from the group consisting of molecular oxygen, hydrogen, nitrogen, arsenic, lithium, chlorine, fluorine, bromine and iodine, and atomic helium, neon, argon and krypton.

5. The apparatus of Claim 1 wherein said at least one sensor comprises a porous ceramic element having electrical properties that vary in relation to the concentration of the infrared-inactive component in effective contact therewith.

6. The apparatus of Claim 5 wherein said at least one sensor comprises a diffusion barrier of either the pinhole or Knudsen type.

7. The apparatus of Claim 5 wherein said at least one sensor is a limiting current-type oxygen sensor.

8. The apparatus of Claim 7 wherein said at least one sensor has integral self-heating means, and wherein said porous ceramic element thereof comprises zirconia.

9. The apparatus of Claim 5 wherein said at least one sensor is a hydrogen sensor of the type that exhibits a change in resistance in relation to the concentration of molecular hydrogen in effective contact therewith.

10. The apparatus of Claim 9 wherein said at least one sensor comprises an array of nanotubes.

11. The apparatus of Claim 10 wherein said nanotubes are of titania fabrication.

12. A method for the analysis of a mixed gas sample, comprising:

passing a sample of a mixed gas into or through the sample cell of an FT-IR gas analyzer, said mixed gas sample containing at least one infrared-active component and at least one infrared-inactive component;

measuring, by FT-IR analysis, the concentration of said at least one infrared-active component in said mixed gas sample; and

concurrently measuring the concentration of said at least one infrared-inactive component in said mixed gas sample by effecting contact of said sample with at least one sensor operatively connected to said sample cell and constructed for generating an electrical signal representative of the concentration of said at least one infrared-inactive component.

13. The method of Claim 12 wherein said FT-IR gas analyzer includes at least one inlet conduit to said gas sample cell thereof and at least one outlet conduit therefrom, and wherein said at least one sensor is disposed for effective contact with said mixed gas sample in at least one of said gas sample cell, said inlet conduit, and said outlet conduit.

14. The method of Claim 12 wherein said FT-IR gas analyzer includes electronic data processing means programmed to determine the presence of infrared-active molecules in said mixed gas sample, said electronic data processing means being operatively connected to said at least one sensor for improving the accuracy of gas-concentration data, in said signal from said at least one sensor, by adjusting said data as necessary to account for such infrared-active molecules.

15. The method of Claim 12 said gaseous infrared-inactive component to which said at least one sensor is responsive is selected from the group consisting of molecular oxygen, hydrogen, nitrogen, arsenic, lithium, chlorine, fluorine, bromine and iodine, and atomic helium, neon, argon and krypton.

16. The method of Claim 12 wherein said at least one sensor comprises a porous ceramic element having electrical properties that vary in relation to the concentration of said infrared-inactive component in effective contact therewith.

17. The method of Claim 16 wherein said at least one sensor comprises a diffusion barrier of either the pinhole or Knudsen type.

18. The method of Claim 16 wherein said at least one sensor is a limiting current-type oxygen sensor, and wherein the concentration of molecular oxygen in said mixed gas sample is measured in said method.

19. The method of Claim 18 wherein said porous ceramic element of said at least one sensor comprises zirconia.

20. The method of Claim 16 wherein said at least one sensor is of the type that exhibits a change in resistance in relation to the concentration of molecular hydrogen in effective contact therewith, and wherein the concentration of molecular hydrogen is measured in said method.

21. The method of Claim 20 wherein said at least one sensor comprises an array of nanotubes.

22. The method of Claim 21 wherein said nanotubes are of titania fabrication.